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STAT

PRINTS FOR LETTER 4 Nov 66

HANDCARRIED

NGA Review Complete

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This document contains
20 pages.

STA

BRIEFING PRINT ENLARGER

8 December 1965

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PROJECT AUTHORIZATION

DEVELOP AN ENLARGER BREADBOARD TO EXPLORE —

1. MECHANISM DESIGNS
2. OPTICAL PERFORMANCE
3. CONVENIENCE OF THE PROPOSED ARRANGEMENT

ORIG. SPECS. (2 MACHINES)

1. 10 – 60X TO 20 X 24 PRINTS
2. 3 – 15X FROM 70MM SQ.
3. ROLL NEGATIVES
4. FLUID GATE
5. B & W PAPER PRINTS PLUS COLOR CAPABILITY

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DECISION ON ARRANGEMENT

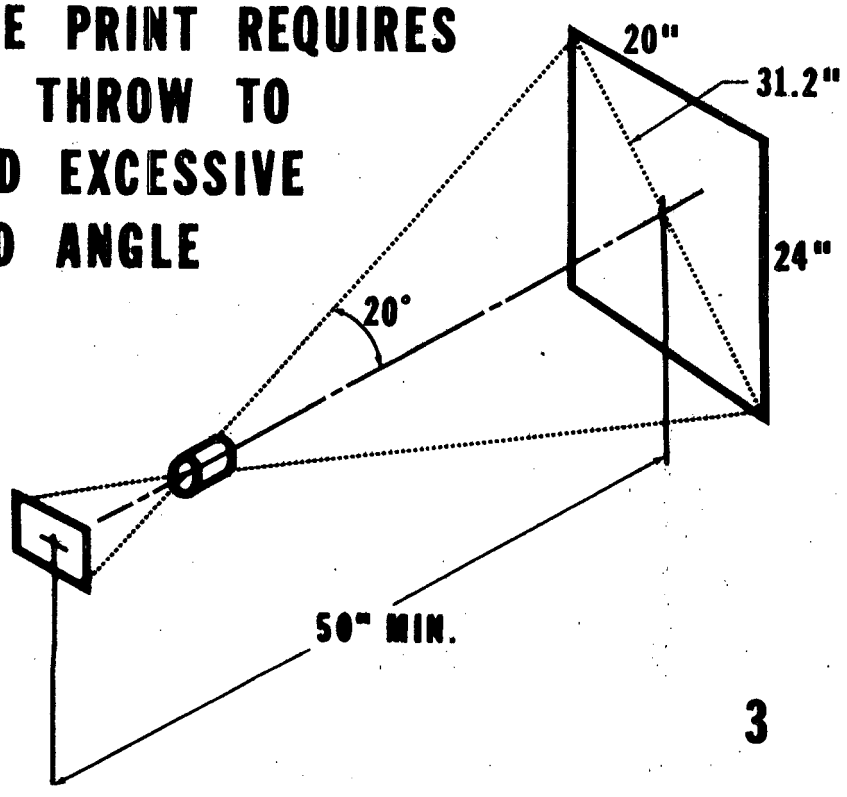
VERTICAL ?

FOLDED ?

HORIZONTAL ?

2

LARGE PRINT REQUIRES LONG THROW TO AVOID EXCESSIVE FIELD ANGLE



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HORIZONTAL ARRANGEMENT

PROVIDES CONVENIENT ACCESS TO NEGATIVE AND PRINT PLATEN WITH THE NECESSARY LONG THROW.

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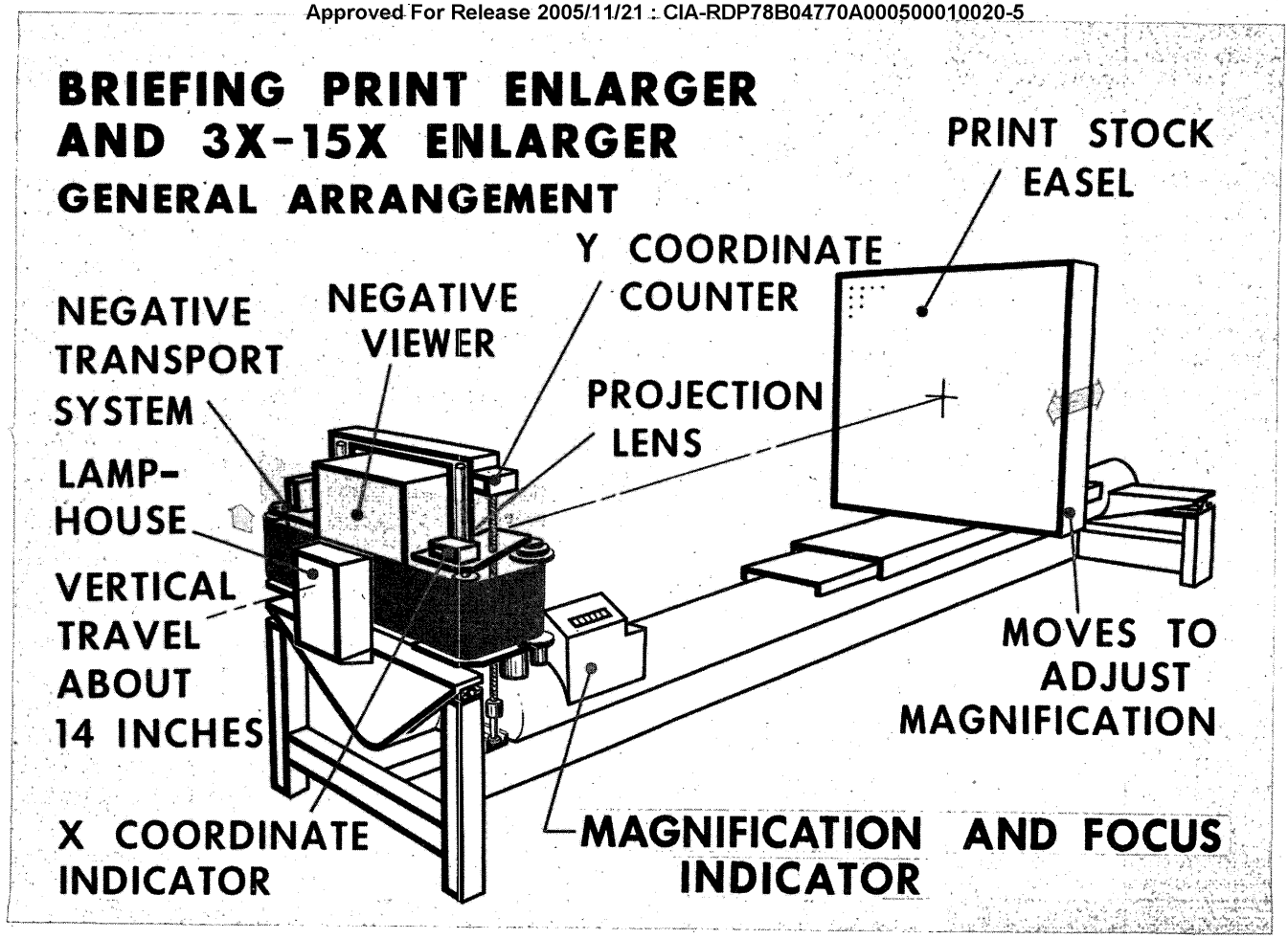
BRIEFING PRINT ENLARGER AND 3X-15X ENLARGER
GENERAL ARRANGEMENT



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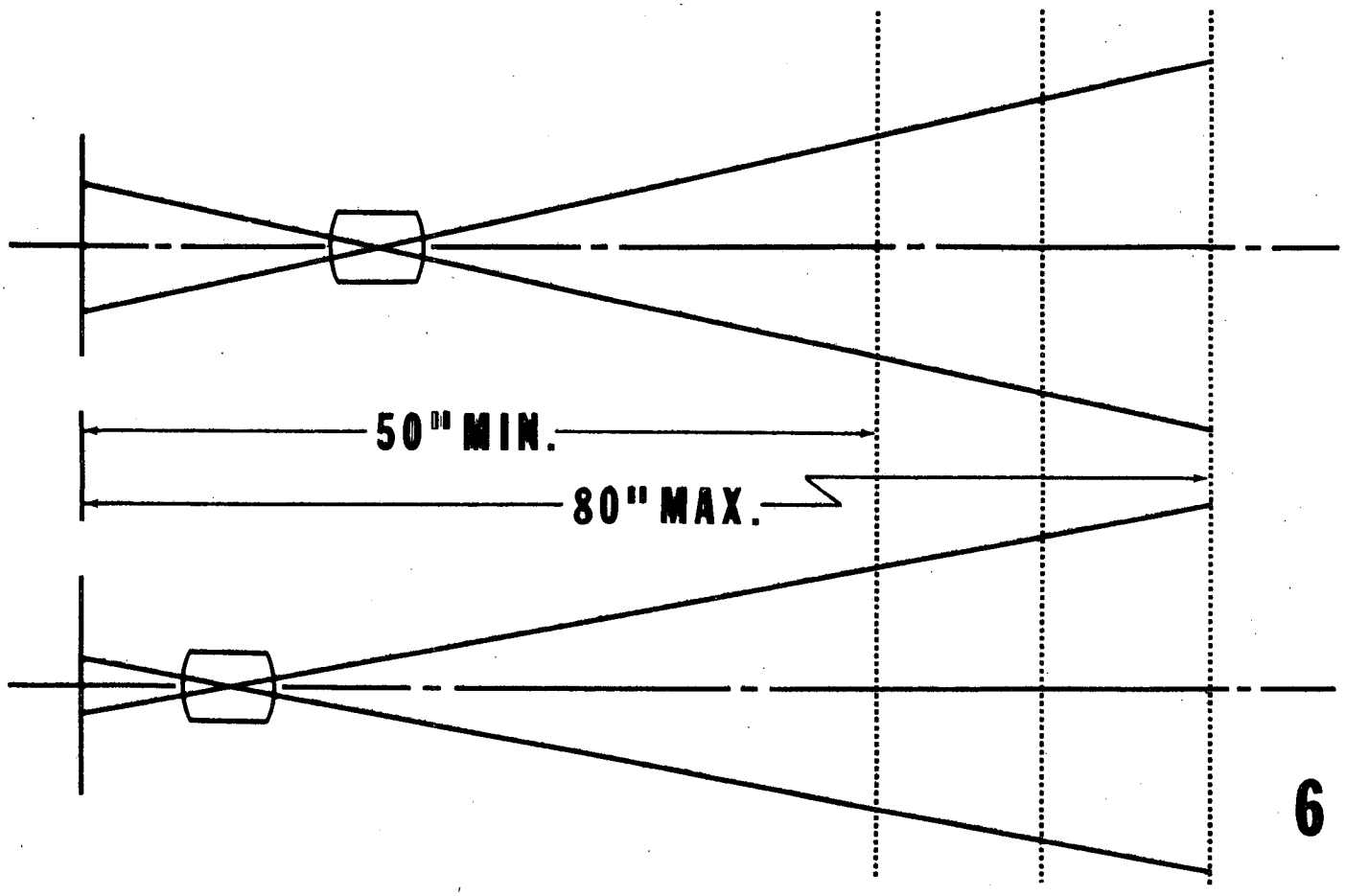
MULTIPLE LENSES TO COVER A WIDE RANGE OF MAGNIFICATION



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BRIEFING PRINT ENLARGER AND 3X-15X ENLARGER
FIELD COVERAGE (PREDICTED)

	MAGNIFICATION		FIELD COVERAGE			
			NEGATIVE		DIAM AT PLATEN	
	MIN	MAX	DIAM	SQUARE	MIN	MAX
1.	2.5X	5.3X	4.0"	2.83"	10.0"	21.2"
2.	4.75	9.0	4.0	2.83	19.0	36.0
3.	8.55	15.0	3.8	2.68	32.5	57.0
4.	14.5	24.7	2.18	1.53	31.6	53.8
5.	24.2	40.2	1.29	0.905	31.2	51.8
6.	38.0	62.5	.82	0.578	31.2	51.2

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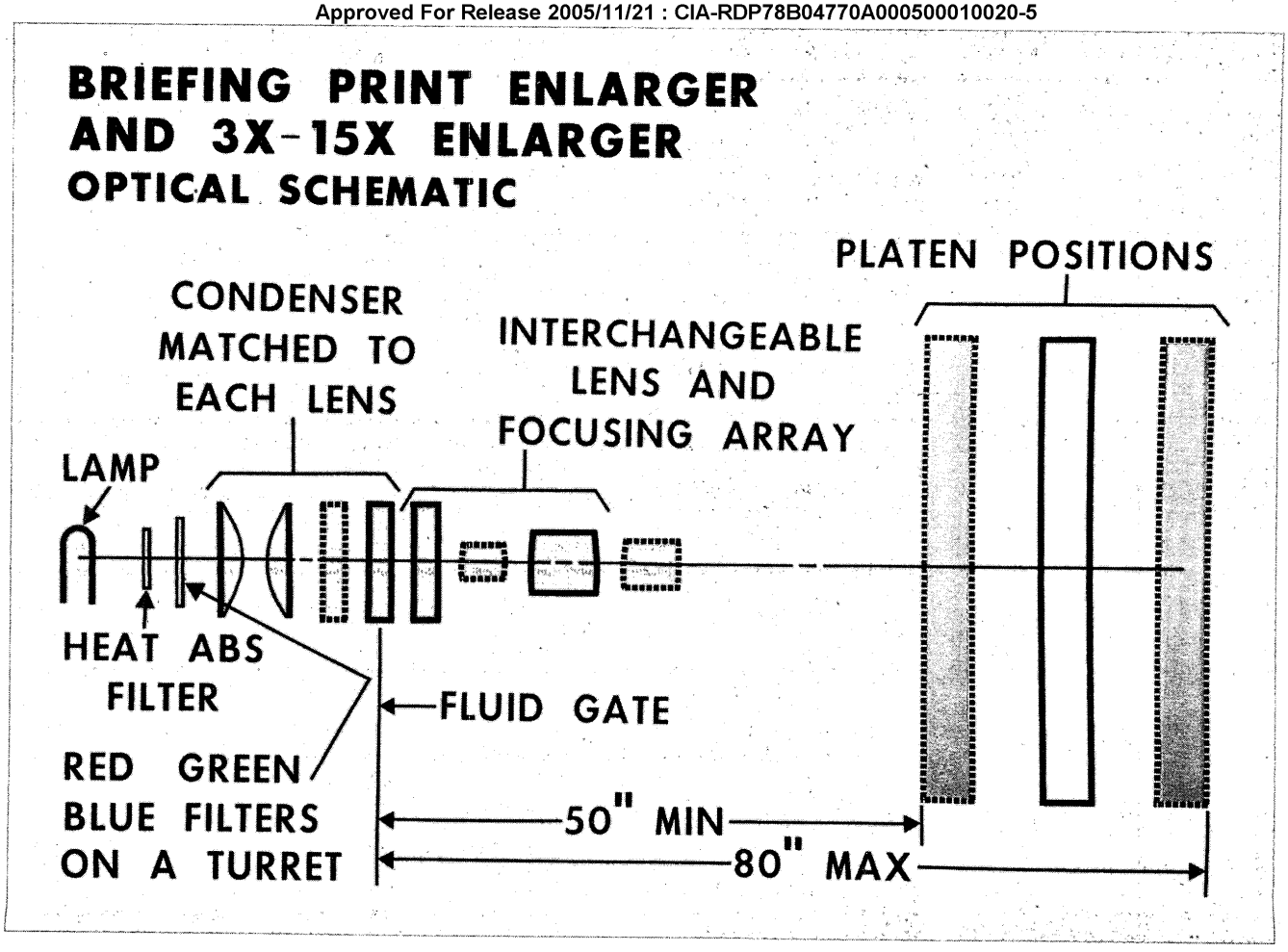
BRIEFING PRINT ENLARGER AND 3X-15X ENLARGER OPTICAL SCHEMATIC



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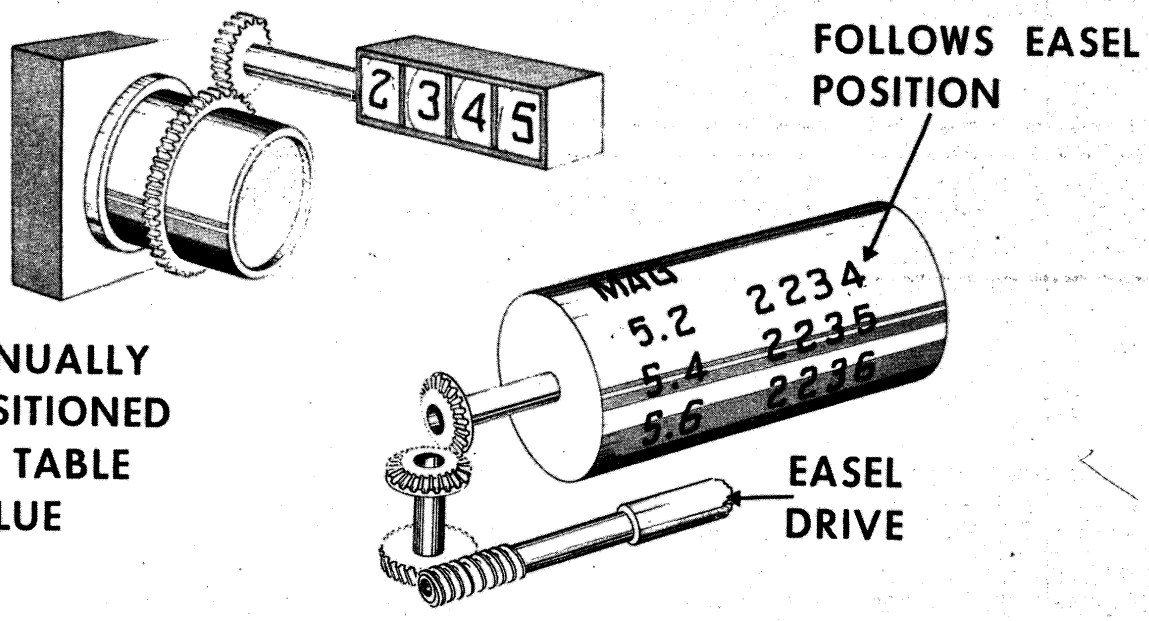
BRIEFING PRINT ENLARGER AND 3X-15X ENLARGER
FOCUS ADJUSTMENT



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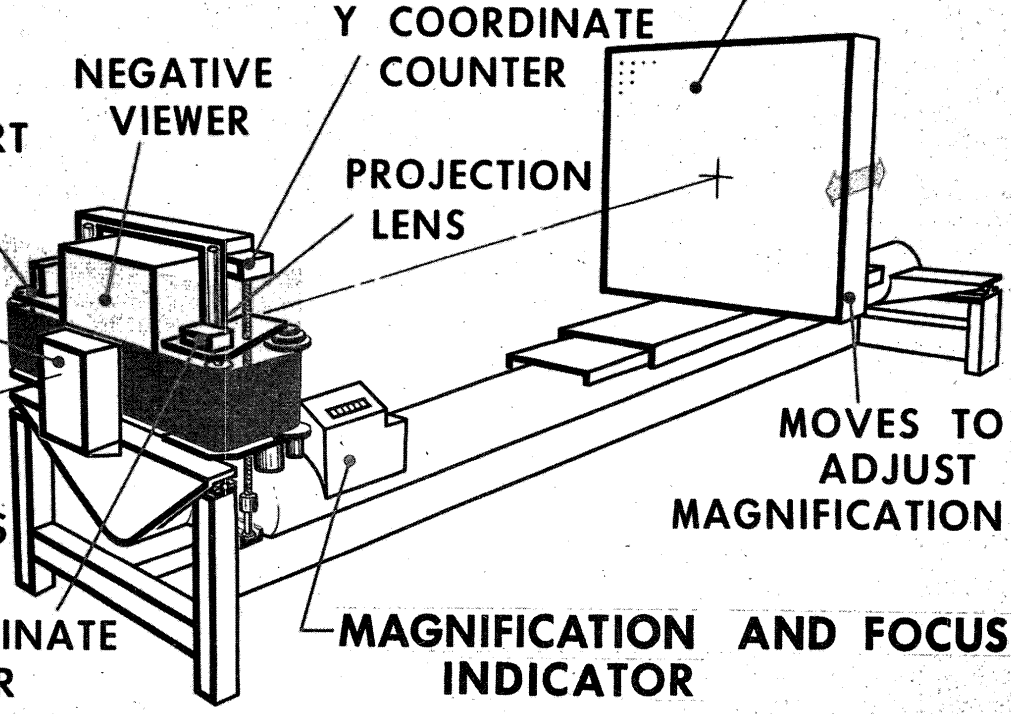
BRIEFING PRINT ENLARGER AND 3X-15X ENLARGER GENERAL ARRANGEMENT



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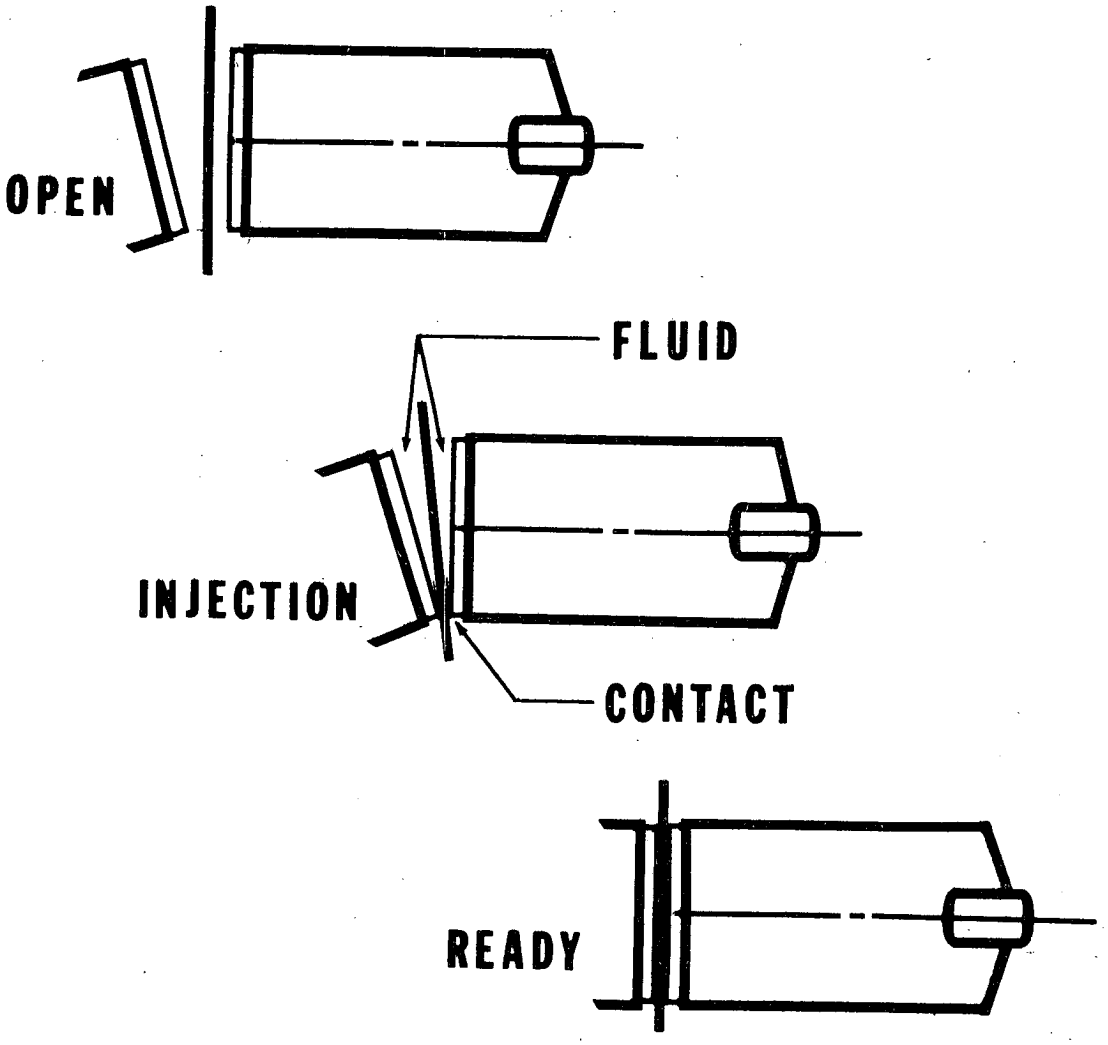
VERTICAL FLUID GATE



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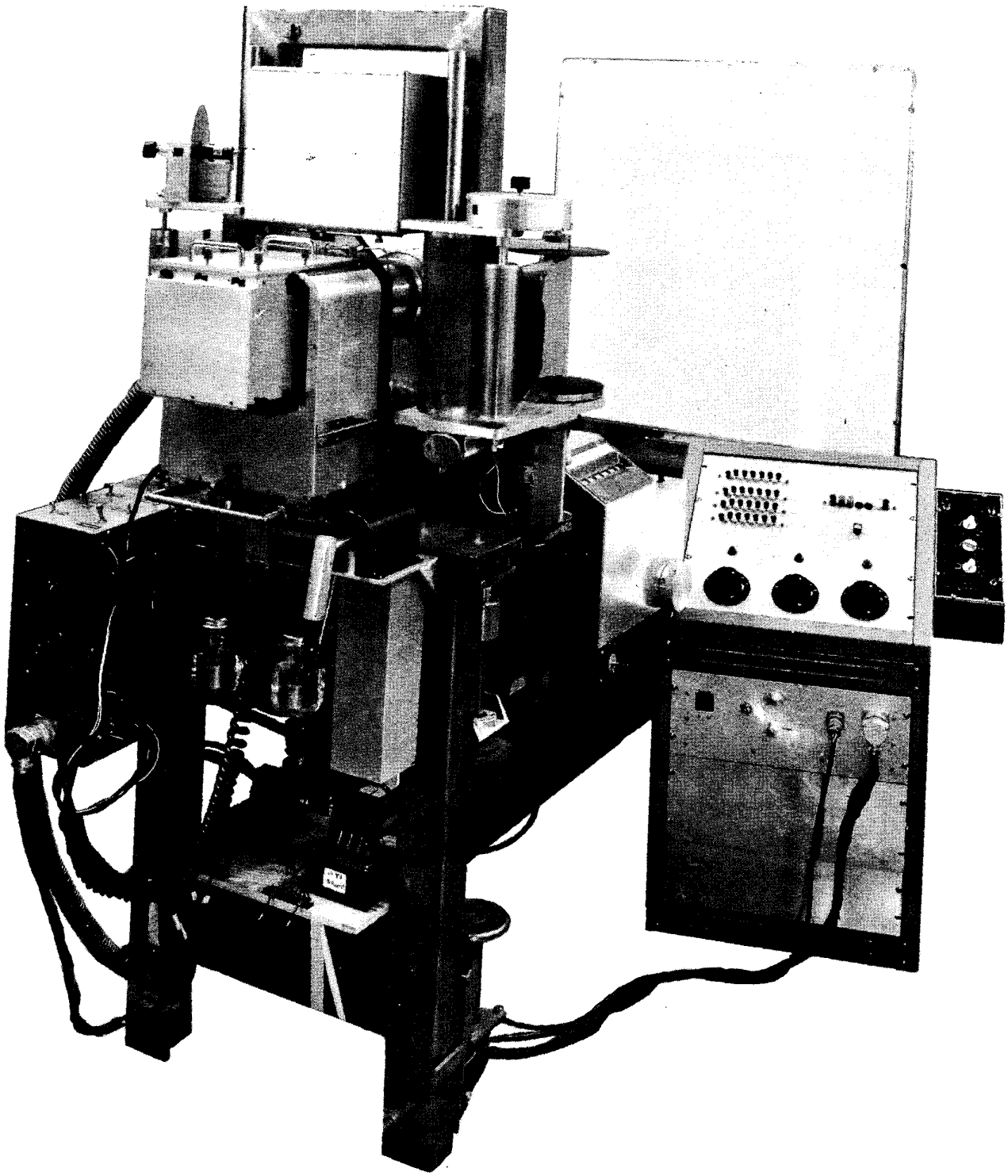

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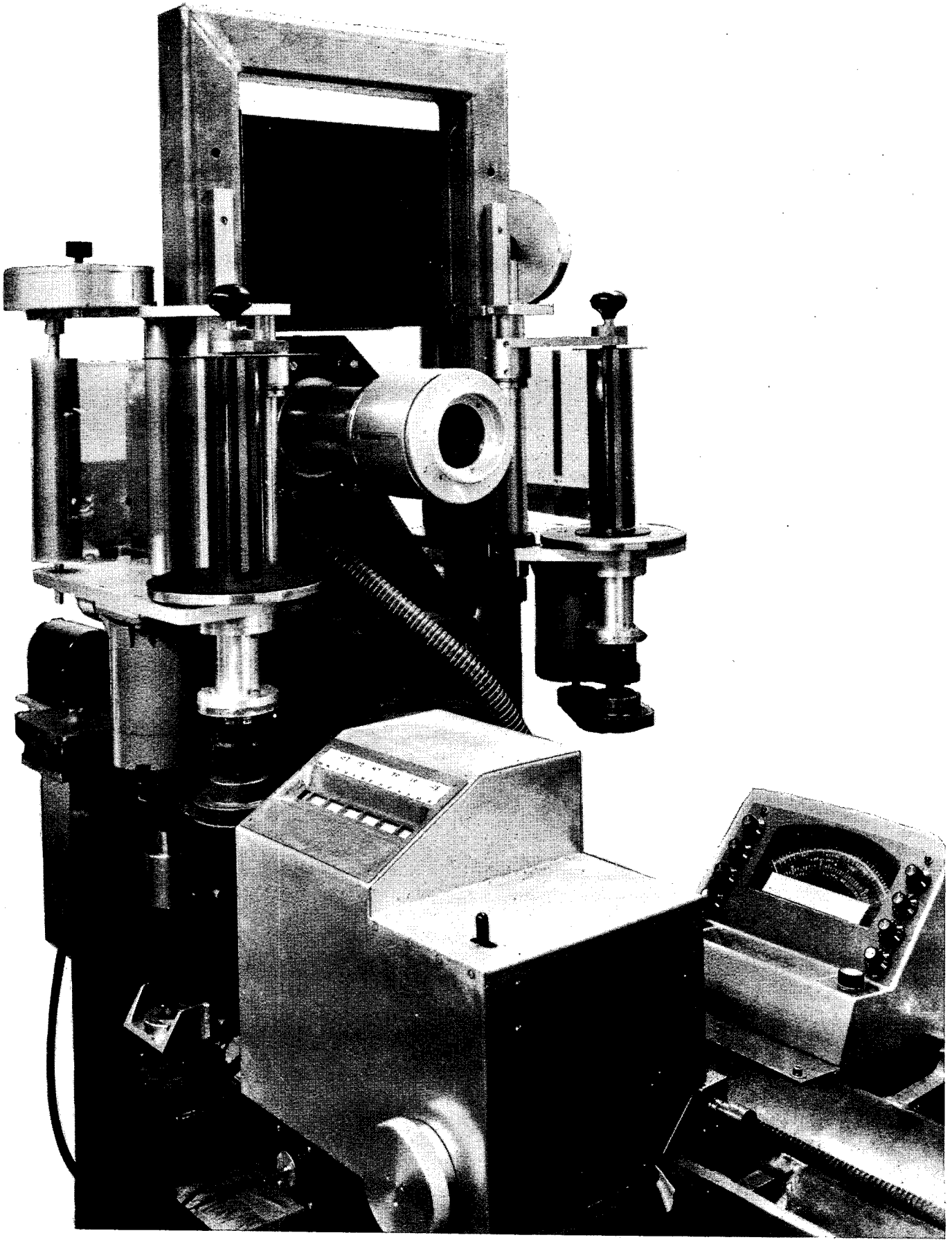

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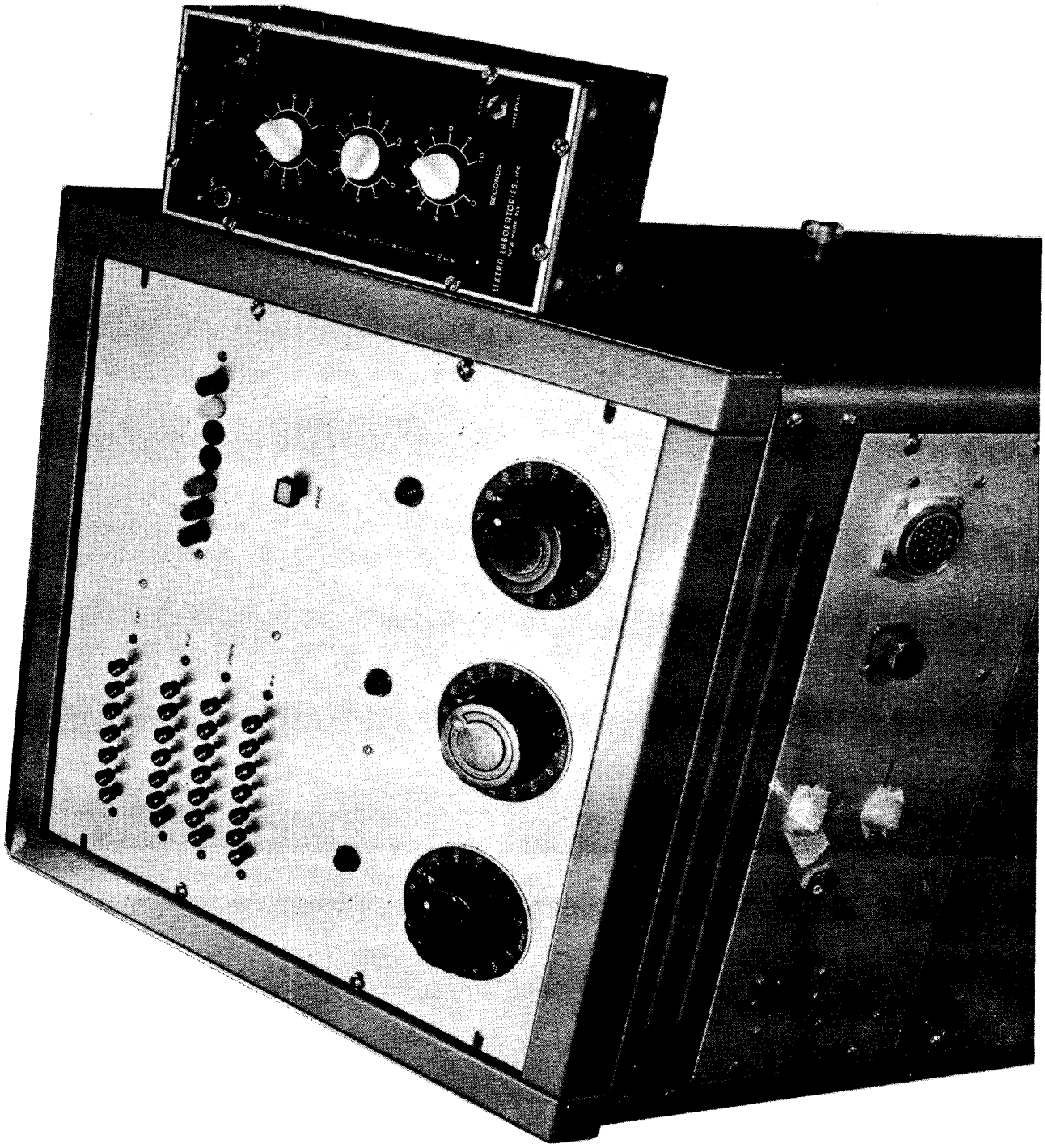

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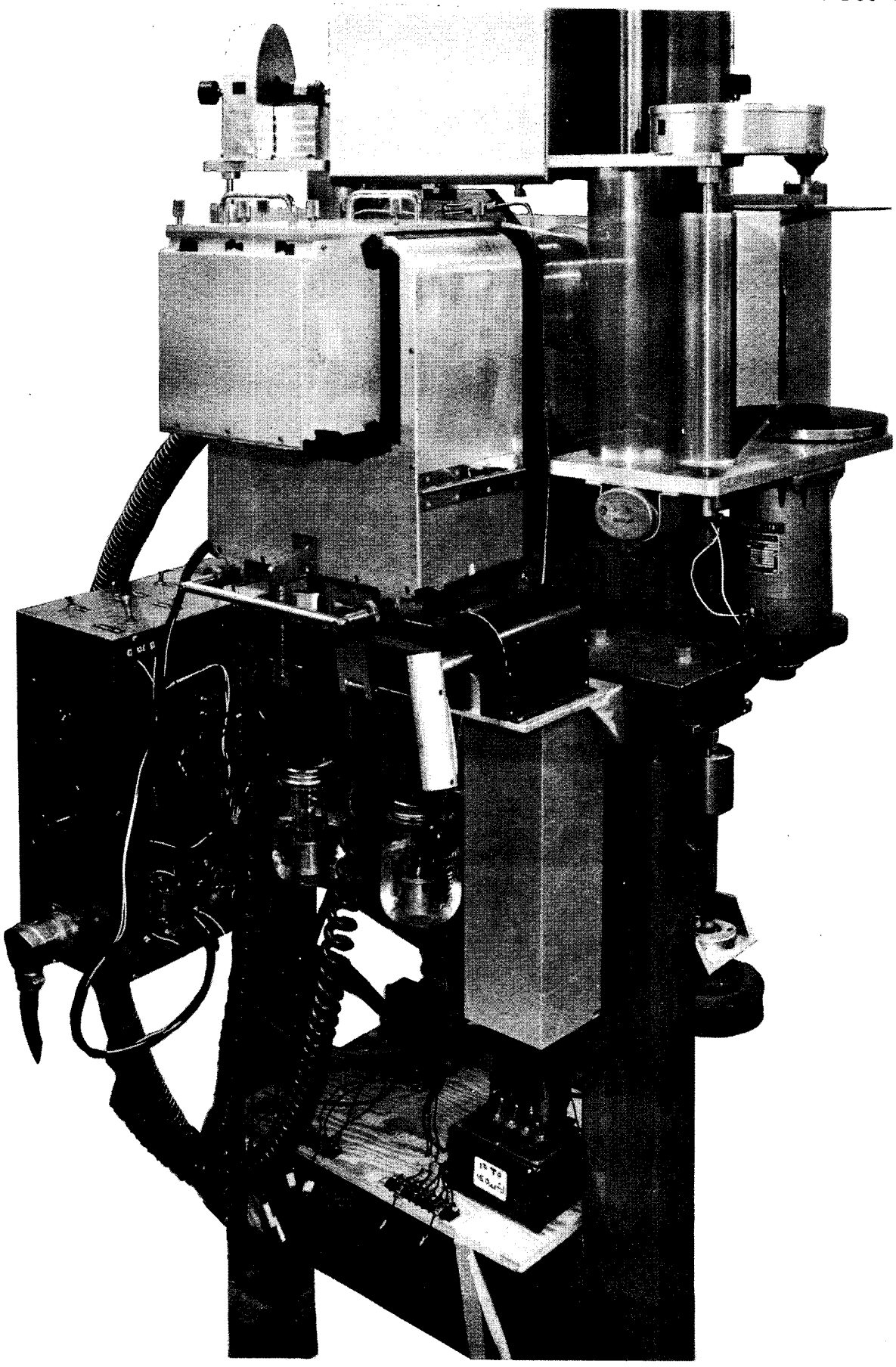

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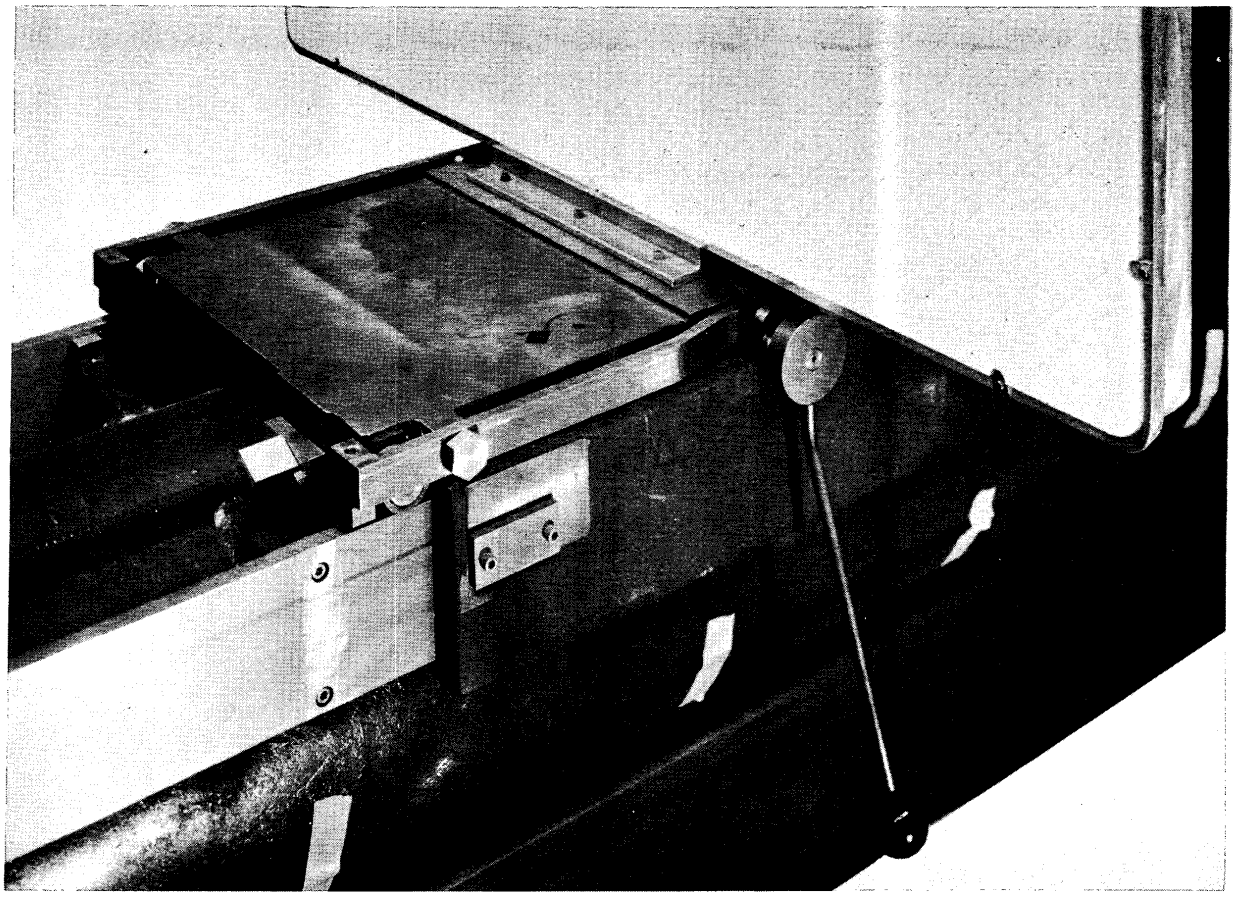

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Field Coverage, BPE Breadboard

Lens	OAC	M	Field Coverage Negative Dia.	Negative Square	Print Diagonal
10.75"	57."	2.95X	3.9"	2.76"	11.6"
	65.	3.77		(70.0mm)	14.7
	80.	5.24			20.4"
7.17	50.0	4.75	3.8	2.72"	18.
	62.	6.48		(69. mm)	24.6
	80.	9.04			34.3
4.85	50.0	8.46	3.8	2.72"	32.3
	62.	10.97		(69. mm)	41.7
	80.	14.71			55.8
3.06	50.0	14.53	2.15	1.52"	31.2
	62.	18.47		(38.6mm)	39.7
	80.	24.36			52.3
1.93	50.0	24.10	1.29	0.91"	31.2
	62.	30.32		(23.1mm)	39.26
	80.	39.64			51.3
1.26	50.0	37.73	0.82	0.58"	31.2
	62.	47.23		(14.7mm)	39.1
	80.	61.48			50.8

Diagonal Length for Various Standard Sheet Sizes

Sheet	Diag.	Sheet	Diag.
8" x 10"	12.8"	16" x 20"	25.6"
10" x 12"	15.6"	20" x 24"	31.2"
11" x 14"	17.7"	30" x 40"	50.0"
14" x 17"	22.0"	40" x 40"	56.5"

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BPE B & W Lenses (W98 Filter - Blue)

EF (In.)	f/No.	Magnification OAC (In.)	Magnification M (Diam.)	Diffraction Lim. Neg. (l/mm)	Diffraction Lim. Print (l/mm)	Observed Resolution Chart	Observed Resolution Neg. (l/mm)	Observed Resolution Print (l/mm)
10.75(1)	f/17.8	57."	2.95	93	31.5			30.
		65.	3.77	98	26.	6/2	89	23.
		80.	5.24	105	20.			17.
7.17(1)	f/12.	50.	4.75	153	32.			26.
		62.	6.48	160	25.	6/5	127	19.
		80.	9.04	167	18.5			14.
4.85(1)	f/7.8	50.	8.46	254	30.			26.
		62.	10.97	260	23.6	7/4	226	20.
		80.	14.71	266	18.			15.
3.06(1)	f/5.	50.	14.53	415	28.5			25.
		62.	18.47	422	23.	8/2	360	19.
		80.	24.36	427	17.			14.
1.93(2)	f/4.2	50.	24.10	505	21.			18.
		62.	30.32	510	16.8	8/4	452	15.
		80.	39.64	513	13.			11.4
1.26(2)	f/2.8	50.	37.73	782	21.			17.
		62.	47.23	782	16.6	9/1	640	13.5
		80.	61.48	782	13			10.4

(1) Aperture Stop Diameter 0.6"

(2) Aperture Stop Diameter 0.45"

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lines/mm

80 - 800 Resolution Charts

	6	7	8	9
1.	80	160	320	640
2.	90	180	360	718
3.	101	202	403	806
4.	113	226	452	
5.	127	254	508	
6.	142	285	570	

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SAMPLE MAGNIFICATION AND FOCUS TABLE

	F 10.755		F 7.171		F 4.846		F 3.061		F 1.932		F 1.264	
	C 21.586		C 14.414		C 8.410		C 5.308		C 3.358		C 2.275	
	K 1.8774		K .7113		K -.3172		K -.5112		K -.6224		K -.0037	
	S .001000		S .001000		S .000100		S .000100		S .000100		S .000156	
	ENLG 101		ENLG 101		ENLG 101		ENLG 101		ENLG 101		ENLG 101	
	LENS 101		LENS 201		LENS 301		LENS 401		LENS 501		LENS 651	
	11/02/65		11/02/65		11/11/65		11/11/65		11/02/65		11/02/65	
OAC	MAGN	FOC	MAGN	FOC	MAGN	FOC	MAGN	FOC	MAGN	FOC	MAGN	FOC
49.0	2.06	3332	4.61	846	8.25	9042	14.20	7267	23.58	7043	36.94	243
49.2	2.09	3271	4.64	836	8.30	9013	14.27	7257	23.69	7040	37.10	242
49.4	2.11	3213	4.66	826	8.34	8984	14.33	7247	23.79	7036	37.26	241
49.6	2.14	3156	4.69	817	8.38	8954	14.40	7238	23.89	7033	37.41	240
49.8	2.16	3101	4.72	807	8.42	8926	14.47	7228	24.00	7029	37.57	239
50.0	2.18	3047	4.75	798	8.46	8897	14.53	7218	24.10	7026	37.73	238
50.2	2.21	2995	4.78	789	8.51	8869	14.60	7209	24.20	7022	37.89	237
50.4	2.23	2944	4.81	779	8.55	8841	14.66	7200	24.31	7019	38.05	236
50.6	2.25	2894	4.84	770	8.59	8814	14.73	7190	24.41	7015	38.21	235
50.8	2.28	2846	4.87	762	8.63	8786	14.79	7181	24.52	7012	38.36	235
51.0	2.30	2798	4.90	753	8.67	8759	14.86	7172	24.62	7009	38.52	234
51.2	2.32	2752	4.93	744	8.72	8732	14.93	7163	24.72	7005	38.68	233
51.4	2.35	2707	4.96	736	8.76	8706	14.99	7154	24.83	7002	38.84	232
51.6	2.37	2663	4.99	727	8.80	8680	15.06	7145	24.93	6999	39.00	231
51.8	2.39	2621	5.01	719	8.84	8653	15.12	7136	25.03	6996	39.16	230
52.0	2.41	2579	5.04	711	8.88	8628	15.19	7127	25.14	6993	39.31	229
52.2	2.44	2538	5.07	703	8.92	8602	15.25	7119	25.24	6989	39.47	229
52.4	2.46	2498	5.10	694	8.97	8577	15.32	7110	25.34	6986	39.63	228
52.6	2.48	2458	5.13	687	9.01	8552	15.38	7102	25.45	6983	39.79	227
52.8	2.50	2420	5.16	679	9.05	8527	15.45	7093	25.55	6980	39.95	226
53.0	2.52	2382	5.19	671	9.09	8502	15.52	7085	25.66	6977	40.11	225
53.2	2.55	2346	5.22	663	9.13	8478	15.58	7076	25.76	6974	40.26	225
53.4	2.57	2309	5.25	656	9.17	8454	15.65	7068	25.86	6971	40.42	224
53.6	2.59	2274	5.27	648	9.22	8430	15.71	7060	25.97	6968	40.58	223
53.8	2.61	2239	5.30	641	9.26	8406	15.78	7052	26.07	6965	40.74	222
54.0	2.63	2205	5.33	633	9.30	8383	15.84	7044	26.17	6962	40.90	221
54.2	2.66	2172	5.36	626	9.34	8359	15.91	7036	26.28	6959	41.06	221
54.4	2.68	2139	5.39	619	9.38	8336	15.98	7028	26.38	6956	41.21	220
54.6	2.70	2107	5.42	612	9.43	8313	16.04	7020	26.49	6953	41.37	219
54.8	2.72	2076	5.45	605	9.47	8291	16.11	7012	26.59	6951	41.53	218
55.0	2.74	2045	5.48	598	9.51	8268	16.17	7005	26.69	6948	41.69	218
55.2	2.76	2014	5.51	591	9.55	8246	16.24	6997	26.80	6945	41.85	217
55.4	2.78	1984	5.53	584	9.59	8224	16.30	6990	26.90	6942	42.01	216
55.6	2.81	1955	5.56	578	9.63	8202	16.37	6982	27.00	6939	42.16	216
55.8	2.83	1926	5.59	571	9.68	8180	16.43	6975	27.11	6937	42.32	215
56.0	2.85	1898	5.62	564	9.72	8159	16.50	6967	27.21	6934	42.48	214
56.2	2.87	1870	5.65	558	9.76	8138	16.57	6960	27.31	6931	42.64	213
56.4	2.89	1843	5.68	551	9.80	8116	16.63	6953	27.42	6929	42.80	213
56.6	2.91	1816	5.71	545	9.84	8095	16.70	6945	27.52	6926	42.96	212
56.8	2.93	1789	5.74	539	9.88	8075	16.76	6938	27.63	6923	43.11	211
57.0	2.95	1763	5.77	533	9.93	8054	16.83	6931	27.73	6921	43.27	211
57.2	2.98	1737	5.79	526	9.97	8034	16.89	6924	27.83	6918	43.43	210
57.4	3.00	1712	5.82	520	10.01	8013	16.96	6917	27.94	6916	43.59	209
57.6	3.02	1687	5.85	514	10.05	7993	17.02	6910	28.04	6913	43.75	209
57.8	3.04	1663	5.88	508	10.09	7973	17.09	6903	28.14	6910	43.91	208
58.0	3.06	1639	5.91	502	10.13	7954	17.16	6896	28.25	6908	44.06	207

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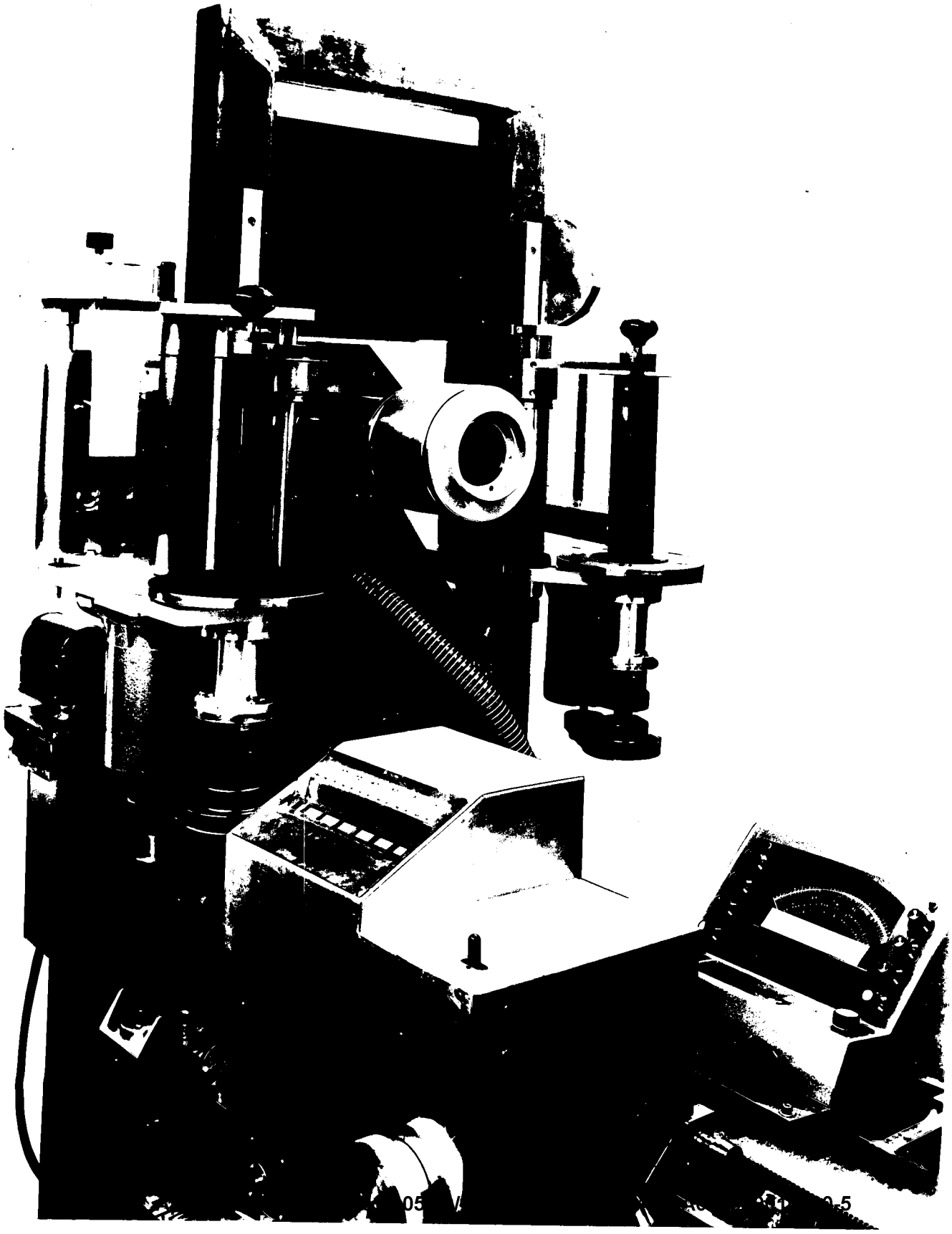

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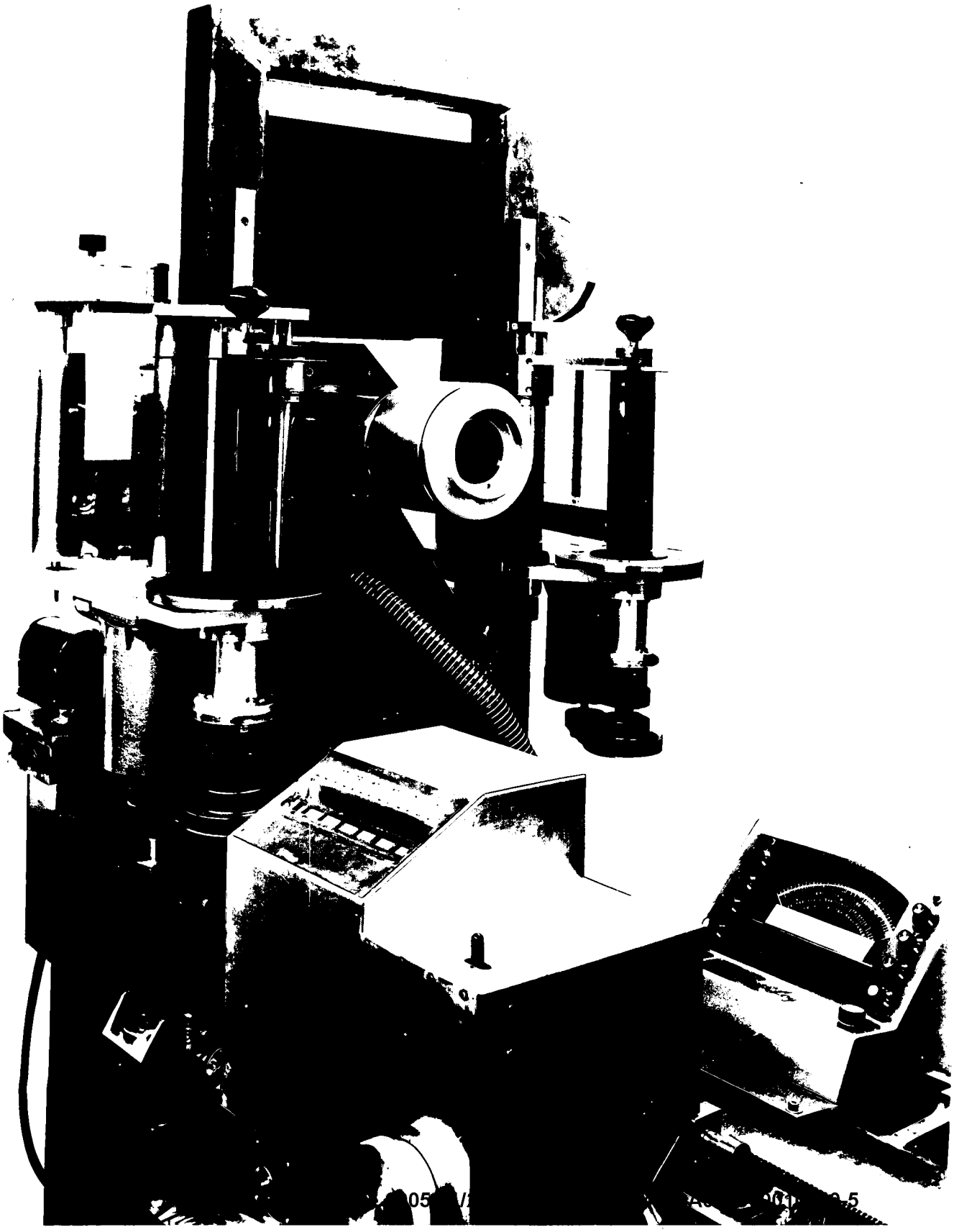

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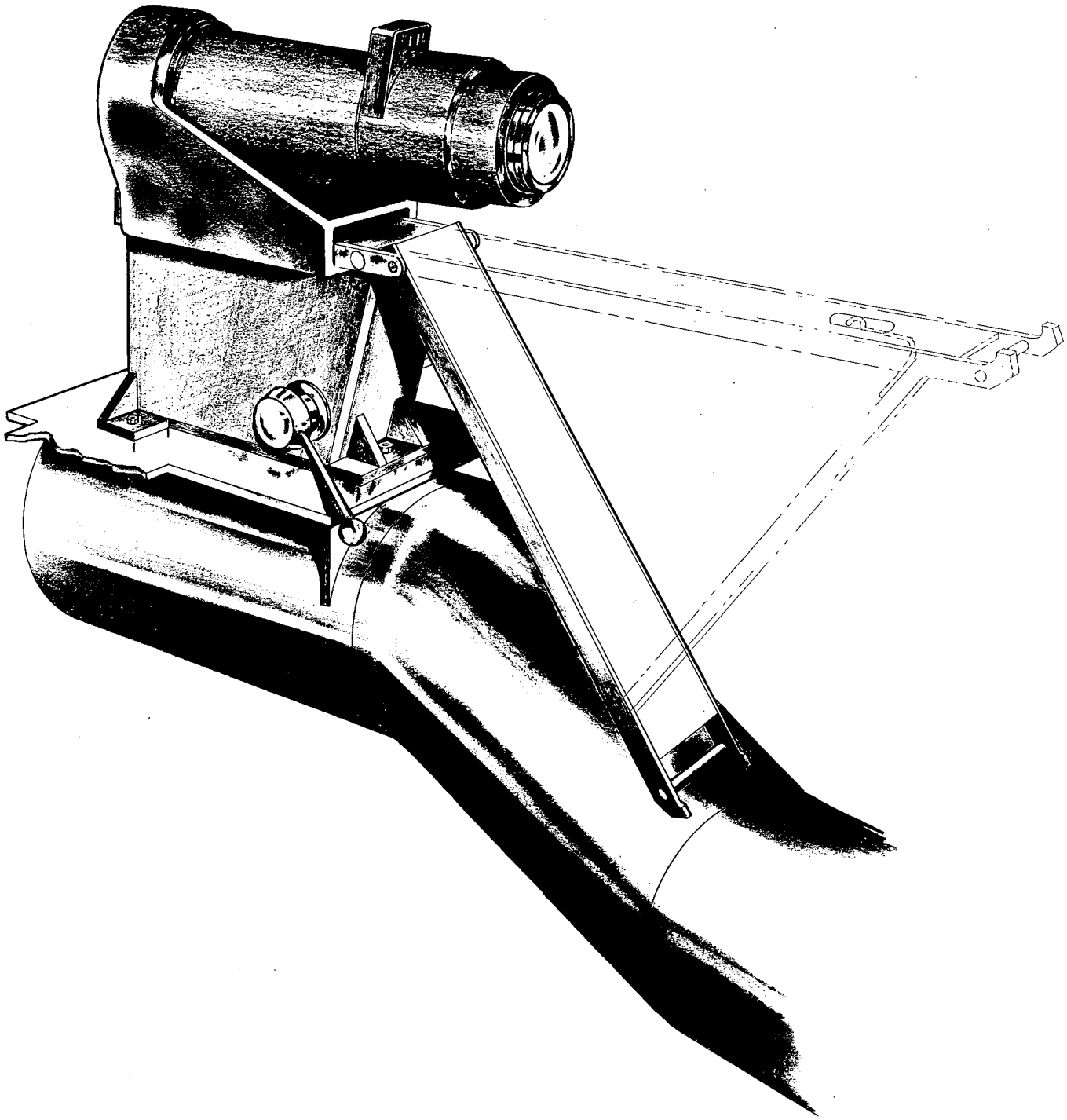

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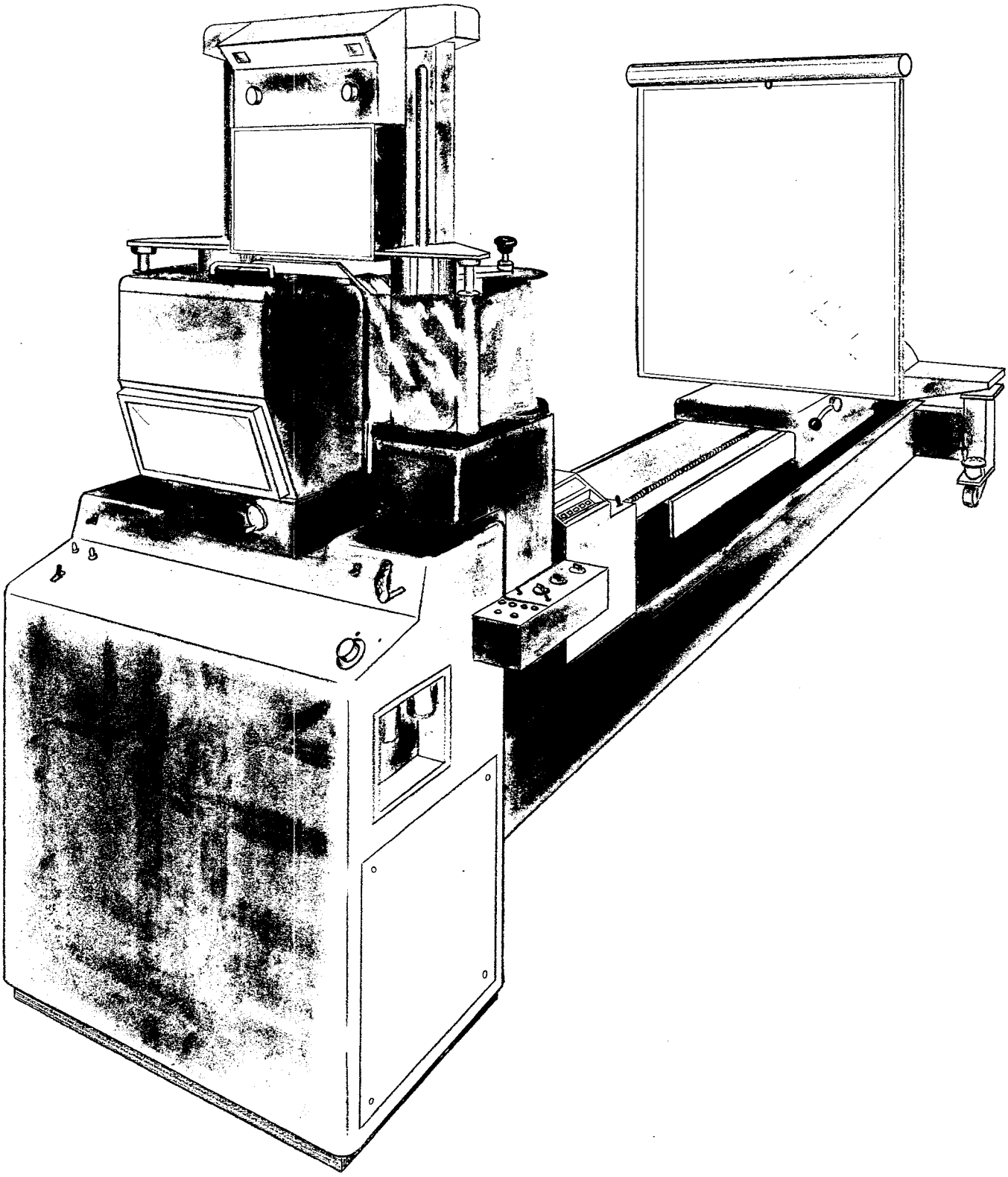

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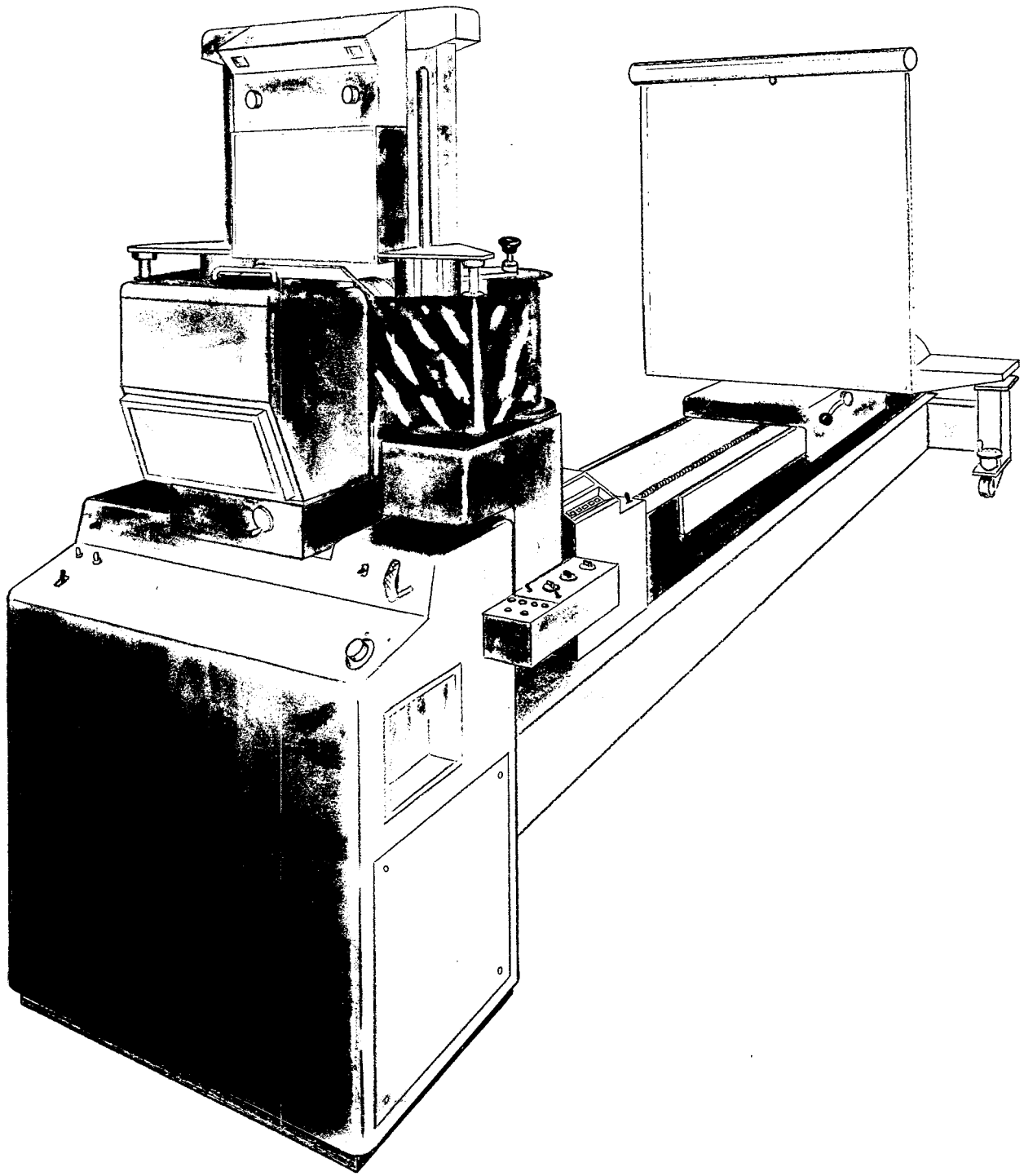

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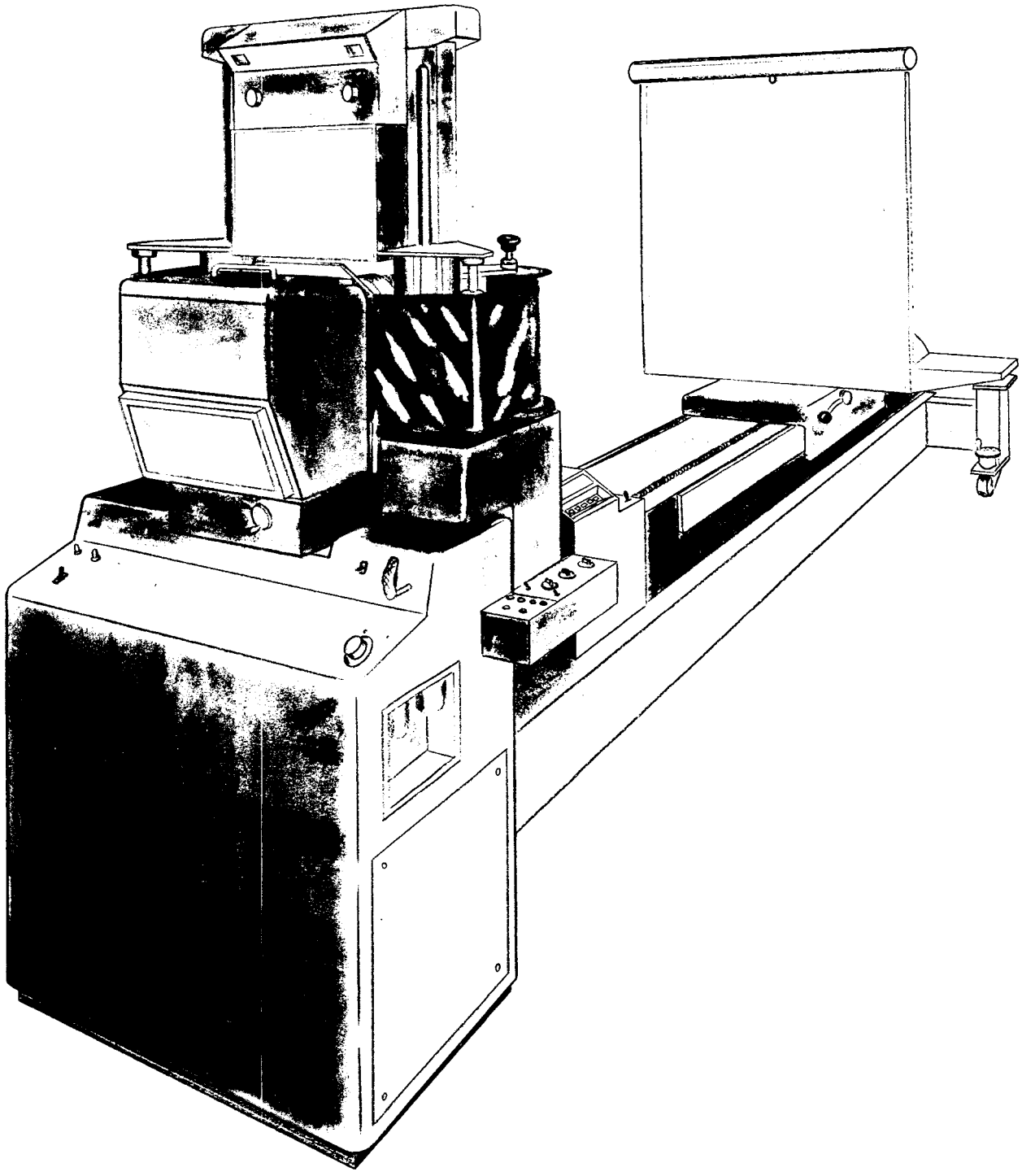

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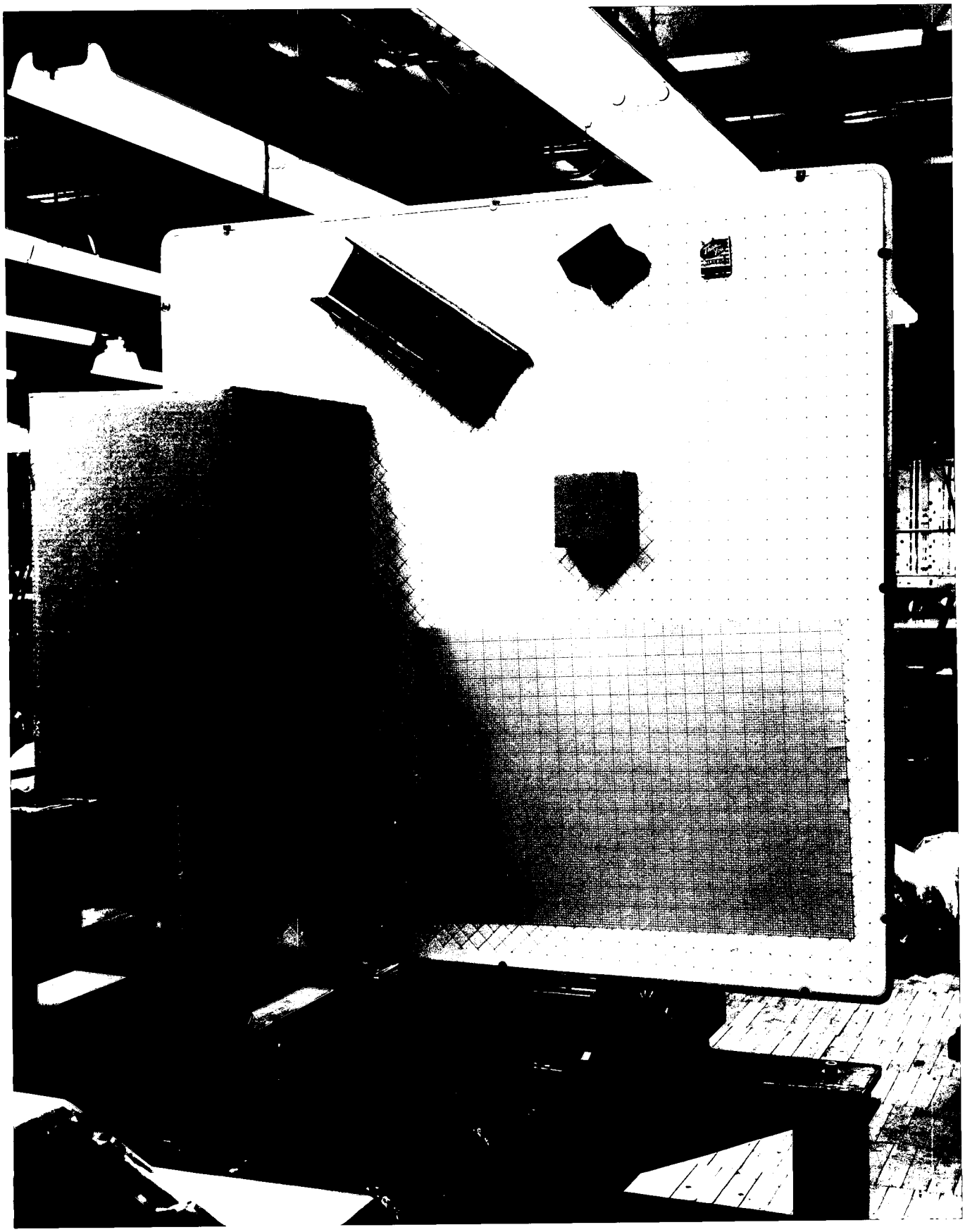

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FIELD COVERAGE (PREDICTED)
PAR 202 - BPE
PAR 224 - 3-15X

	MAGNIFICATION		FIELD COVERAGE			
			NEGATIVE		PLATEN	
	MIN.	MAX.	DIAM.	SQUARE	Min. MAG.	Max. MAG.
1.	2.5X	5.3X	4.0"	2.83"	10.0"	21.2"
2.	4.75	9.0	4.0	2.83	19.0	36.0
3.	8.55	15.0	3.8	2.68	32.5	57.0
4.	14.5	24.7	2.18	1.53	31.6	53.8
5.	24.2	40.2	1.29	0.905	31.2	51.8
6.	38.0	62.5	.82	0.578	31.2	51.2

DIAGONAL LENGTH FOR VARIOUS STANDARD SHEET SIZES

SHEET	DIAG.	SHEET	DIAG.
8" x 10"	12.8"	16" x 20"	25.6"
10" x 12"	15.6"	20" x 24"	31.2"
11" x 14"	17.7"	30" x 40"	50.0"
14" x 17"	22.0"	40" x 40"	56.5"

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RDP

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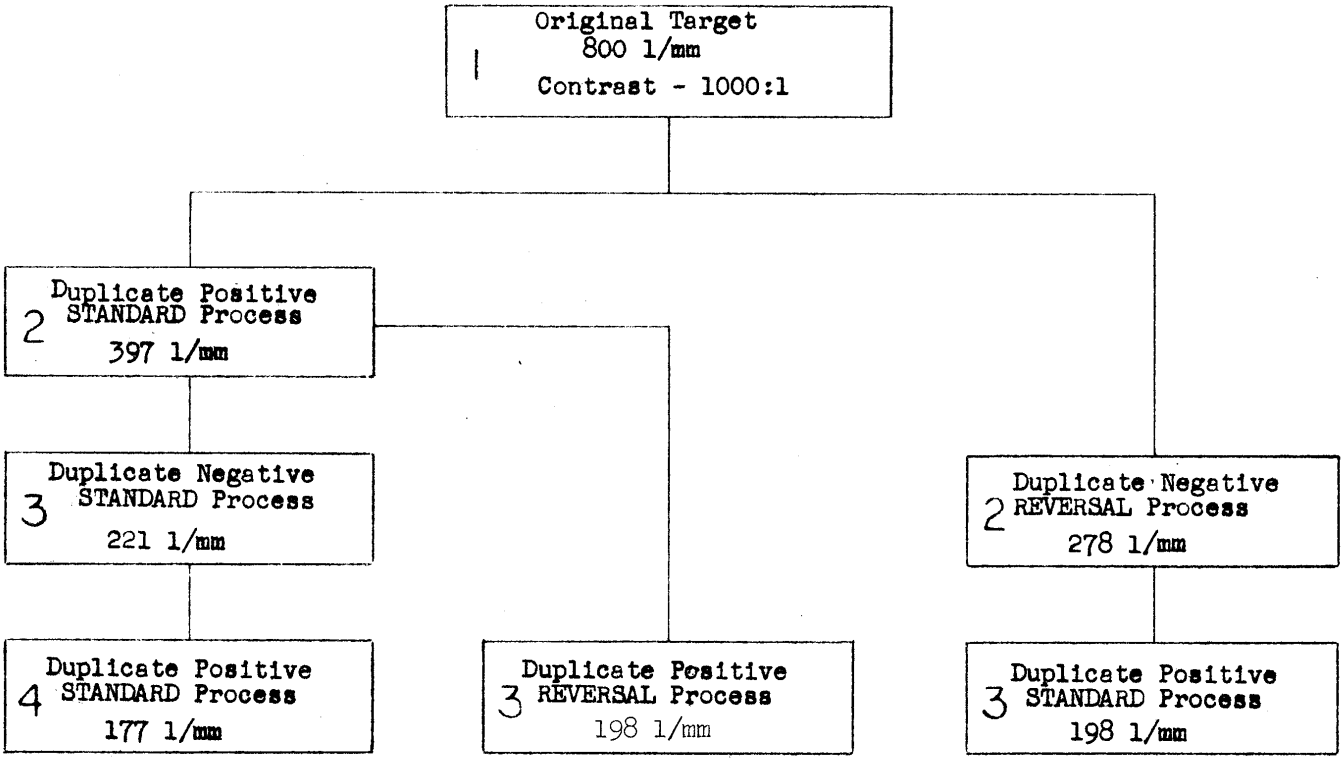
RESOLVING POWER GENERATION SERIES
FOR
TYPE 8430 DUPLICATING FILM



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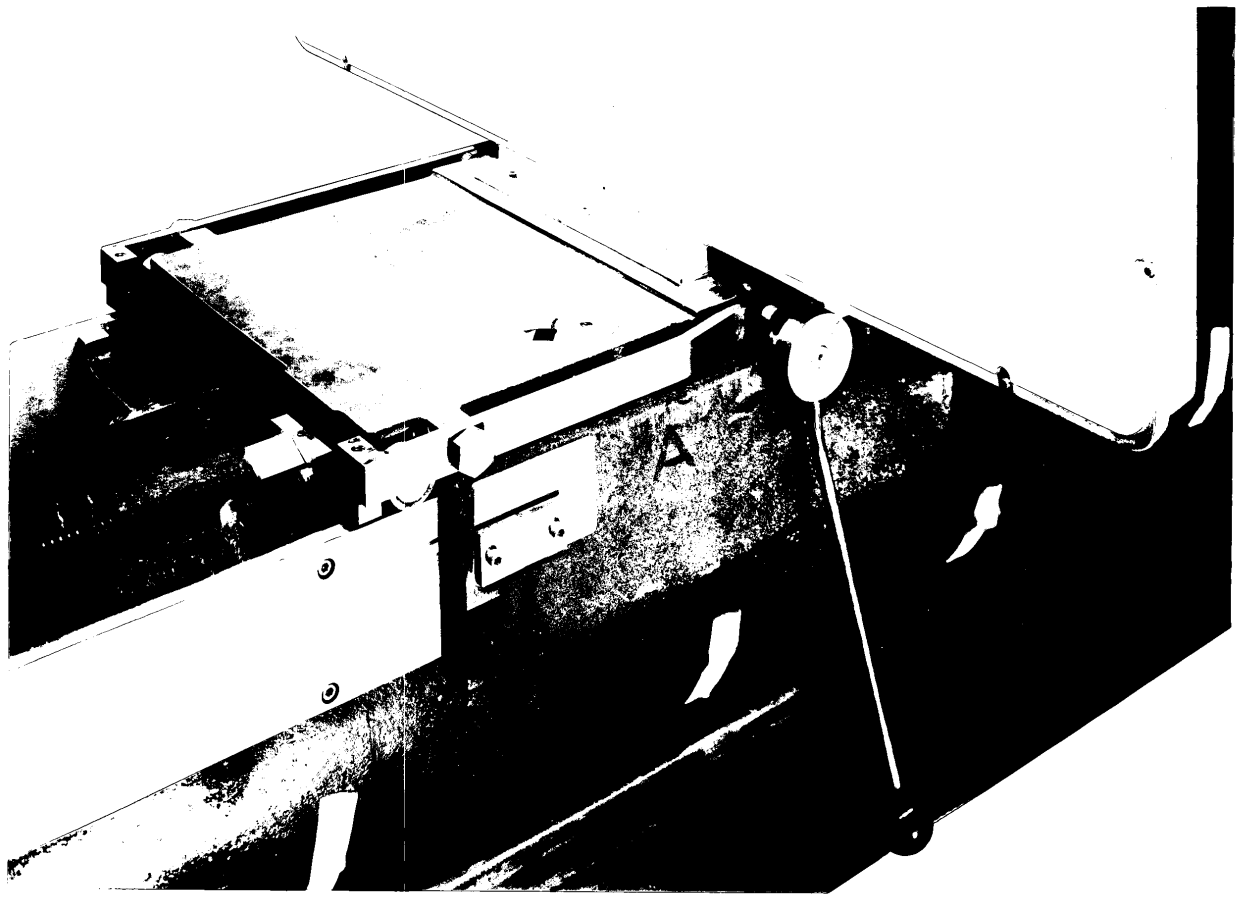

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